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Original article

Are YouTube videos on allergic rhinitis a good source of information for patients seeking a cure for their illness?

Les vidéos YouTube sur la rhinite allergique sont-elles une bonne source d'informations pour les patients cherchant à guérir leur maladie ?

S. Doluoglu^{a,*}, S. Gultuna^b

^a University of Health Sciences Turkey, Dışkapı Yıldırım Beyazıt Training and Research Hospital, Department of Otorhinolaryngology Head and Neck Surgery, Ankara, Turkey

^b University of Health Sciences Turkey, Dışkapı Yıldırım Beyazıt Training and Research Hospital, Department of Immunology and Allergy, Ankara, Turkey

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ABSTRACT

The aim of this study was to investigate the quality and reliability of YouTube videos related to allergic rhinitis. The videos were separated into two groups (reliable: Group 1; unreliable: Group 2) according to whether or not the content was scientifically reliable, proven, accurate, and useful, determined by two allergy specialist physicians. The DISCERN reliability tool, Global quality scale (GQS), and JAMA scoring system were also used as video scoring tools in the evaluations. Group 1 included 112 videos, and Group 2, 30 videos. The GQS points were 4 (2–5) and 4 (2–5) in Group 1, and 2 (1–5) and 2 (1–5) in Group 2 ($P = 0.0001$). The points in the DISCERN and JAMA scoring systems were found to be higher in Group 1 than Group 2 ($P = 0.0001$). Despite the reliability of the majority of videos on YouTube related to allergic rhinitis, the number of unreliable videos was not small. These unreliable videos can cause negative outcomes for patients. YouTube should give more weighting to videos containing scientifically proven information.

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R É S U M É

Dans cette étude, nous avons cherché à étudier la qualité et la fiabilité des vidéos YouTube liées à la rhinite allergique. Les vidéos ont été séparées en deux groupes (fiables : groupe 1 ; non fiables : groupe 2) selon que le contenu était ou non scientifiquement fiable, prouvé, précis et utile, déterminé par deux médecins spécialistes des allergies. L'outil de fiabilité DISCERN, l'échelle de qualité globale (GQS) et le système de notation JAMA ont également été utilisés comme outils de notation vidéo dans les évaluations. Le groupe 1 comprenait 112 vidéos et le groupe 2, 30 vidéos. Les points GQS étaient 4 (2–5) et 4 (2–5) dans le groupe 1, et 2 (1–5) et 2 (1–5) dans le groupe 2 ($p = 0,0001$). Les points dans les systèmes de notation DISCERN et JAMA se sont avérés plus élevés dans le groupe 1 que dans le groupe 2 ($p = 0,0001$). Malgré la fiabilité de la majorité des vidéos sur YouTube liées à la rhinite allergique, il existe un nombre non négligeable de vidéos peu fiables. Ces vidéos peu fiables peuvent entraîner des résultats négatifs pour les patients. YouTube devrait donner plus de poids aux vidéos contenant des informations scientifiquement prouvées.

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1. Introduction

Allergic rhinitis (AR) is one of the most common diseases affecting adults [1]. Innumerable treatment methods have been reported

for the treatment of this disease. AR is an inflammatory response to inhaled allergens, which is mediated by IgE expressed by the nasal mucosal membranes. The main symptoms include rhinorrhea, nasal congestion, nasal itching and sneezing. It has been reported that 10%–40% of the population in Europe suffer from AR [2]. Many drugs and methods have been recommended in treatment, such as distancing from materials which could be known allergens (use of air filtration systems, keeping domestic animals, use of acaricide to kill mites, etc), topical steroids, oral antihistamines,

* Corresponding author.

E-mail addresses: sumeyradoluoglu@gmail.com (S. Doluoglu), selcan.gultuna@gmail.com (S. Gultuna).

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intranasal antihistamines, combined pharmacological treatments, immunotherapy, acupuncture, and herbal therapies [3]. If AR is not treated, quality of life is negatively affected and therefore there is a significant economic burden [2]. Patients seek different treatments when quality of life is severely negatively affected, as there is no single recommended treatment or because they have not been satisfied with the treatments used.

The world is now living in the age of the internet and the easiest route of accessing information is the internet. In the last two decades, the internet has become extremely popular for accessing healthcare information [4]. YouTube has become the most popular social media platform for all internet users to research healthcare and medical information online [5]. Previous studies have researched the reliability and quality of health-related videos in the field of Ear, Nose, and Throat (ENT) and other areas [6–10]. To the best of our knowledge, there has been no study that has investigated the reliability of YouTube videos related to allergic rhinitis. Therefore, the aim of this study was to investigate the quality and reliability of YouTube videos related to allergic rhinitis.

2. Material and Methods

Videos on YouTube related to allergic rhinitis were scanned using the key words “allergic rhinitis, allergic rhinitis treatment, allergic rhinitis management”. The first 400 videos according to the level of relevance were listed. To facilitate the evaluation and because YouTube videos are continuously updated, the videos were uploaded to their own playlist by the evaluators at the same time (14 January 2021). All the videos were scrutinized and evaluated by an ENT specialist and an allergy specialist, each blinded to the other's evaluation. Allergic Rhinitis and Its impact on Asthma (ARIA) and American Academy of Otolaryngology- Head and Neck Surgery Clinical Practice Guideline were used for these evaluations. Videos were excluded from the study if they had irrelevant content, no sound recording, were not in English, or were shorter than 1 min.

For each video a record was made of the number of views, likes, dislikes, and comments, the length of the video, and the number of daily views, the date that the video was uploaded to YouTube was also recorded. The video power index was calculated with the formula of $(\text{likes}/\text{likes} + \text{dislikes}) \times 100$. The videos were separated into two groups according to whether or not the content was scientifically reliable, proven, accurate, and useful, determined by two allergy specialist physicians (SA, SG) with reference to previous studies [7,9].

Group 1 included videos defined as reliable information if they included scientifically accurate information about AR and treatment (eg, definition, symptoms, epidemiology, diagnosis, treatment). Group 2 included videos defined as unreliable information if they included scientifically unproven, non-medical information. Videos, which included both scientific and unscientific information, were assigned to Group 2. When there was disagreement between the specialist raters, a consensus was reached and the video was assigned to the appropriate group.

The videos were also separated into 5 categories according to the person or institution providing the information: physicians/universities/professional organizations (source 1), health-related website (source 2), individual users/patients (source 3), non-physician healthcare personnel (source 4), and television programme (source 5).

The DISCERN reliability tool, Global quality scale, and JAMA scoring system were used as video scoring tools in the evaluations. The original DISCERN is a scale of 15 items used for the evaluation of health information quality. In this study, a 5-point modified

DISCERN tool was used to score video reliability, as in previous studies [7,11].

The Global quality scale (GQS) is used to evaluate the general quality of videos. In the 5 items of the GQS, a score of 1–2 points indicates low quality, 3 points intermediate quality, and 4–5 points high quality [12]. JAMA is a well-known quality tool that is used to evaluate information obtained from health-related internet sites. It includes 4 criteria of authorship, attribution, disclosure, and currency. Each criteria is scored with 1 point to give a maximum total of 4 points, indicating high quality [13].

2.1. Statistical Analysis

The data analyses were performed with PASW 18 software (SPSS/IBM, Chicago, IL, USA). Visual (histogram and probability graphs) and analytical (Kolmogorov-Smirnov test) methods were used to determine conformity of the variables to normal distribution. The results were reported as mean $\pm$ standard deviation (SD), or when distributions were skewed, as median (minimum – maximum) values. Categorical variables were given as number (*n*) and percentage (%). The significance of the differences between the groups in terms of median values was investigated with the Mann-Whitney U-test. Kruskal Wallis variance analysis was used for intergroup comparisons of continuous variables (Post hoc: Bonferroni). The Student's *t*-test was used for the intergroup analysis

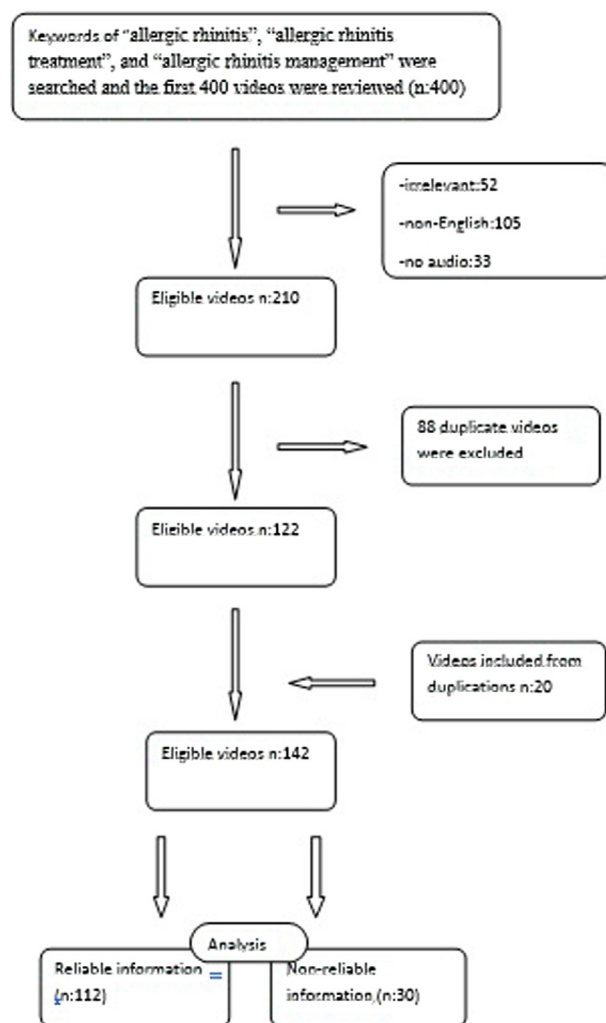


Fig. 1. Flowchart of the selection of appropriate Youtube videos.

Table 1
Comparison of the video characteristics between the groups.

	Reliable information, n = 112	Nonreliable information, n = 30	P-value
DISCERN score ^b	3 (2–5)	2 (1–5)	0.0001 ^{*,a}
GQS score ^b	4 (2–5)	2 (1–5)	0.0001 ^{*,a}
JAMA score ^b	3 (1–4)	1 (1–3)	0.0001 ^{*,a}
DISCERN score ^c	3 (2–5)	2 (1–4)	0.0001 ^{*,a}
GQS score ^c	4 (2–5)	2 (1–5)	0.0001 ^{*,a}
JAMA score ^c	3 (1–4)	1 (1–3)	0.0001 ^{*,a}
Views	2152 (27–3.559.718)	14085 (371–176.190)	0.002 ^{*,a}
Views per day	2.7 (0.02–2.222)	12.3 (0.2–389.8)	0.003 ^{*,a}
Comments	1 (0–1.175)	8.5 (0–295)	0.01 ^{*,a}
Comments per day	0.0003 (0–1.97)	0.01 (0–1.1)	0.007 ^{*,a}
Duration of video (min)	3.2 (1–59.5)	3.4 (1–12)	0.91 ^{*,a}
Duration of Youtube (day)	955 (76–4.080)	1125 (70–4.677)	0.8 [*]
Likes	15 (0–13.000)	74 (0–4.400)	0.002 ^{*,a}
Dislikes	0 (0–1.700)	8 (0–214)	0.0001 ^{*,a}
Video power index	96.9 (0–100)	94.3 (0–100)	0.009 ^{*,a}
Source of upload, n, %			
^d Source 1	66 (58.9%)	10 (33.3%)	0.0001 ^{**,a}
^d Source 2	19 (17%)	5 (16.7%)	
^d Source 3	5 (4.5%)	9 (30%)	
^d Source 4	1 (0.9%)	4 (13.3%)	
^d Source 5	21 (18.8%)	2 (6.7%)	

^a Statistically significant.^b Rater 1.^c Rater 2.^d Physicians/universities/professional organizations (source 1), health related website (source 2), individual users/patients (source 3), non physician health personnel (source 4) ve TV program show (source 5).^{*} Mann-Whitney U test.^{**} Chi² test.**Table 2**
Comparison of DISCERN, GQS, and JAMA score according to source of video.

	Physicians/ universities/ professional organizations	Health related website	Individual users/patients	Non physician health personnel	TV program show	P-value
DISCERN score ^a	3 (2–5)	3 (2–5)	2 (1–4)	2 (2–4)	3 (2–5)	0.0001 [*]
GQS score ^a	4 (1–5)	4 (2–5)	3 (2–4)	2 (2–5)	4 (1–5)	0.002 [*]
JAMA score ^a	2 (1–4)	2 (1–4)	1 (1–3)	1 (1–3)	2 (1–4)	0.0001 [*]
DISCERN score ^b	3 (1–5)	3 (2–5)	2 (1–4)	2 (1–4)	3 (2–5)	0.0001 [*]
GQS score ^b	4 (1–5)	4 (1–5)	2 (1–5)	2 (1–5)	4 (1–5)	0.002 [*]
JAMA score ^b	2 (1–4)	2 (1–4)	1 (1–2)	1 (1–3)	2 (1–4)	0.0001 [*]

^{*} Kruskal Wallis test.^a Rater 1.^b Rater 2.

of continuous variables. Nominal variables were assessed with the Pearson's Chi² or Fisher's exact test. Inter-rater agreement was determined using Cohen's kappa score. Interobserver reliability for the 3 tools was quantified by calculating the intraclass correlation coefficient. A value of $P < 0.05$ was considered statistically significant.

3. Results

From the first 400 videos added to the playlist, 142 met the study criteria and were included in the study for analysis (Fig. 1). Group 1 (reliable information) included 112 videos, and Group 2 (unreliable information), 30 videos. The inter-rater agreement in the formation of the groups was excellent (Kappa coefficient = 0.89, $P = 0.0001$). The number of likes and dislikes were significantly lower in Group 1 than in Group 2; likes: 15.50 (0–13000) vs. 74.50 (0–4400) and dislikes 0 (0–1700) vs. 8 (0–214) ($P = 0.002$, $P = 0.0001$, respectively). The video power index was determined as 97 (0–100) in Group 1, and 94 (0–100) in Group 2 ($P = 0.009$) (Table 1).

In the evaluation of the groups with the GQS scoring tool, the scores given by both evaluators to the videos containing useful information were found to be high. The GQS points given by the

two evaluators (SA and SG) were 4 (2–5) and 4 (2–5) in Group 1, and 2 (1–5) and 2 (1–5) in Group 2 ($P = 0.0001$). The points given by both evaluators in the DISCERN and JAMA scoring systems were found to be statistically significantly higher in Group 1 than Group 2 ($P = 0.0001$ in all comparisons) (Table 1). The intraclass correlation coefficient (ICC) values for the GQS, DISCERN, and JAMA were determined as 0.94, 0.94, and 0.96, respectively ($P = 0.0001$ for all).

Videos uploaded by patients/individuals were determined at the rate of 30% in Group 2, and at 4.5% in Group 1 ($P = 0.0001$) (Table 1). The videos in Group 1 had richer content in terms of etiology, general information, symptoms, and treatment. The comparisons of the GQS, DISCERN, and JAMA of the groups according to the source of the video are shown in Table 2.

4. Discussion

YouTube is a video-sharing platform, which was established in California, USA, in 2005, and it has become the second most visited website in the world after Google search [14]. YouTube is used by 95% of internet users as it is easily accessed, free of charge, and videos in different languages can be viewed [15]. It has also become a portal for high earnings and fame for many

people known as YouTubers. People are increasingly watching videos under the titles of subjects they like on this platform, and videos about the medical aspects of diseases and treatments are also often viewed. Healthcare professionals (doctors, nurses) can follow their own field with related medical videos and videos of operations. The main problem here is whether or not these videos are scientifically reliable. Videos containing scientifically unconfirmed information can cause serious harm to the viewer.

In recent years, valuable articles have been published in literature related to the quality and reliability of YouTube videos on the subject of health [7–9,11,16–18]. To the best of our knowledge, there is no study in literature that has evaluated the scientific quality and reliability of videos related to allergic rhinitis, and therefore this is the first study on that subject. Of the total 142 videos included in this study, 112 (81.9%) were determined to be reliable and were included in the reliable information group, and 30 (31%) videos were included in the unreliable information group. These rates are similar to the findings of most articles in literature [7,9,11].

In contrast, the majority of previous studies that have evaluated YouTube videos on medical topics have found the videos to be unreliable [9,18–20]. Unfortunately, the total number of views of those videos is close to 7 million. It is known that videos with many views and likes are not necessarily the most scientifically accurate videos. The YouTube search algorithms place these videos on the first pages of the recommended videos in the search engine. From the evidence gained, it would be more appropriate to have videos prepared by professional healthcare organizations and specialist physicians. YouTube should be especially sensitive on the subject of placing health-related videos.

In the GQS, DISCERN, and JAMA tools completed by two evaluators in the current study, statistically significantly higher points were given to the videos in Group 1. However, the number of daily views and likes of videos containing reliable and useful information were determined to be statistically significantly lower. In a study by Diri et al., which evaluated the reliability of YouTube videos on premature ejaculation, the viewing rates of reliable and unreliable videos were found to be similar [7]. This demonstrates that viewers on this social platform do not differentiate which videos are more accurate and have a high scientific level of information. In the current study, the source of the unreliable videos was determined to be more individuals/patients and healthcare personnel who are not doctors. It is obvious that information given by doctors who are specialists on this subject will be more reliable.

Non-scientific treatments (herbal treatment, acupuncture, homeopathy, etc) suggested by non-specialists rather than proven scientific treatments recommended for allergic rhinitis can harm rather than benefit the patient. Despite these treatments having many views and likes on YouTube, they are not recommended alone in clinical guidelines [2,21]. These clinically unproven treatments can cause harm to patients because of allergic body structures, and life-threatening results may be seen because of a predisposition to the sudden development of a hypersensitivity reaction [22]. Therefore, when uploading these types of videos YouTube should be extremely careful about viewer access and priority should be given to videos with scientific content.

There were some limitations to this study, primarily that both evaluators started to view and create a playlist from the first 400 videos at the same time. Therefore, the videos, which emerged at the same time, were included for evaluation, whereas YouTube is a dynamic platform, which continuously includes new videos. Only videos in English were included as that is accepted as a common international language. Therefore, the first 400 YouTube videos on this subject were evaluated, but they may not have been representative of all the uploaded videos on this subject. However, strong aspects of this study were that three evaluation tools were used together, which have been used in previous studies to evaluate

the quality and reliability of videos, and that this study is the first to have evaluated the reliability of YouTube videos about allergic rhinitis.

5. Conclusion

According to the evaluations of this study, despite the reliability of the majority of videos on YouTube related to allergic rhinitis, the number of videos determined to be unreliable was not small. These unreliable videos can cause negative outcomes for patients. Therefore, when accepting videos containing allergic rhinitis and other medical information, YouTube should give more weighting to videos containing scientifically proven information which have been prepared by professionals and institutions specialised on the subject.

Ethical approval

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Disclosure of interest

The authors declare that they have no competing interest.

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